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# MARKETING PROBLEMS OF SAN JOAQUIN VALLEY COOPERATIVES

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CALIFORNIA AGRICULTURAL EXPERIMENT STATION
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# MARKETING PROBLEMS OF SAN JOAQUIN VALLEY DAIRY COOPERATIVES

S. H. Sosnick[1/]

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## A. Summary of Recommendations

We group the implications of our study into two categories. First, what the cooperatives can do:

a. Arrange for a detailed study of the possibility of reducing marketing costs by locating facilities for pyramiding the market milk of one or more cooperatives (and perhaps others) at or near the metropolitan bottling plants to which deliveries are regularly made. (See Part D.)

b. Arrange for a detailed study of the costs and benefits in shipping directly from dairy farms to metropolitan holding or processing plants all Grade A production whose sale today or tomorrow as market milk is reasonably predictable. (See Part E.)

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c. Arrange for a detailed study of economies possible from adapting plant operations to the scales and locations that would be most economical if the cooperatives were one association, and of means of attaining such economies. (See Part G.)

Second, what the control authorities can do:

a. Re-examine the question whether the prevailing disproportionate burden from "surpluses" on producers in the San Joaquin Valley is equitable or efficient, and review procedures that might partially or wholly prorate this burden (though not the "surpluses" themselves) over a wider group of producers. (See Part C.)

b. Consider whether economies possible in direct shipment remove the justification of a country-plant handling charge on at least some Class 1 sales of market milk, and whether the handling charge on Class 1 sales of market cream corresponds merely to extra shipping costs. (See Part F.)

c. Consider providing inducements to distributors to pyramid themselves or to facilitate more efficient cooperative marketing by either placing orders earlier or giving greater advance notice of orders. (See Part D.)

## B. Introduction

1. Reasons for the Study.--In July, 1957, the Boards of Directors of several dairy cooperatives in the San Joaquin Valley requested the Giannini Foundation of Agricultural Economics of the University of California to study the changing complexion of milk marketing in the San Joaquin Valley and the impact of such changes on the operations of the dairy cooperatives concerned. The cooperatives wished to obtain recommendations on actions they might take individually or collectively to adjust to changing market conditions. A similar request was later received from the Dairy Department of the California Farm Bureau Federation.

The original request indicated that seven dairy cooperatives in or near the San Joaquin Valley wished to participate in the study and were willing to supply necessary information about their organizations. Later, however, circumstances prevented participation by two of the associations.

2. Sources of Data.--The sources of data for this study were monthly, annual, and irregular reports of the California Department of Agriculture, and financial statements and internal operating records of the five dairy cooperatives. Part of the information from each cooperative came on forms furnished by the authors.

The data so obtained were supplemented by visits to the five cooperatives and to several country plants operated by proprietary milk distributors. These visits afforded an opportunity for frank discussion of operating and related problems. In addition, the authors visited large milk transportation companies to discuss the problems inherent in country collection of milk and in bulk shipments to metropolitan areas.

Figure 1.

Geographical Distribution of the 27 Largest Milk Distributors in the San Joaquin Valley District.

o= cooperative
x= proprietary

Source: Department of Dairy Industry, University of California, Davis

Certain aspects were discussed with officials of the Bureau of Milk Control, members of the Dairy Department of the California Farm Bureau Federation, dairymen, and other persons familiar with the dairy situation in the San Joaquin Valley.

3. The Cooperatives Involved.--The cooperatives involved have been part of the California dairy industry for many years. They operate in the heart of the San Joaquin Valley dairy district (see Figure 1). Their ages and principal locations are indicated in Table 1.

TABLE 1

Associations Participating in the Study

| Name | Year organized | Principal location |
|---|---|---|
| | 1 | 2 |
| Milk Producers Association of Central California | 1916 | Modesto |
| Los Banos Dairymen's Association | 1924 | Los Banos |
| Danish Creamery Association | 1895 | Fresno |
| Kings County Creamery Association | 1917 | Lemoore |
| Dairymen's Cooperative Creamery Association | 1909 | Tulare |

All five were originally organized to process a variety of manufactured dairy products, but all now receive both market and manufacturing milk (one has handled grade A since late 1956 only). They receive an important part of the State's milk production--in recent years, close to 10 percent of total commercial milk production in California, and one-fifth to one-fourth of production in the San Joaquin Valley (see Table 2).

TABLE 2

Whole Milk Received by the Five Cooperatives as a Percentage of Commercial Production in California and in the San Joaquin Valley, 1952-1956

| | 1952 | 1953 | 1954 | 1955 | 1956 |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Grade A: | | | | | |
| California | 4.8 | 4.9 | 5.6 | 5.9 | 6.1 |
| San Joaquin | 17.5 | 17.5 | 18.9 | 19.6 | 19.4 |
| Grade B: | | | | | |
| California | 17.3 | 16.5 | 17.8 | 18.3 | 18.1 |
| San Joaquin | 27.1 | 25.5 | 27.0 | 27.3 | 27.0 |
| Total: | | | | | |
| California | 8.5 | 8.4 | 9.5 | 9.7 | 9.3 |
| San Joaquin | 22.3 | 21.5 | 23.0 | 23.5 | 22.7 |

Sources: 1) California Crop and Livestock Reporting Service, Dairy Information Bulletin, Vols. IX-XIII, Tables 3 and 7. 2) California Crop and Livestock Reporting Service, Manufactured Dairy Products, Milk Production, Utilization, and Prices; 1956, p. 15. 3) Records of the five cooperatives.

The cooperatives obtain their milk supplies almost entirely in the form of whole milk collected at members' dairy farms. Aggregate membership in the cooperatives has rapidly decreased since at least 1952, reaching 3,281 in 1957 (see Table 3).[3/] The number of members, however, is appreciably greater than the number of shippers.[4/] We later discuss what has occurred to the latter.

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3/ Actually, this aggregate movement conceals opposite trends among the several associations. In two, membership is in fact declining; in two others, membership has changed irregularly and without evident trend; in one, membership has grown steadily.

4/ The explanation may lie in delays in terminating members who either leave dairying or undertake to deliver elsewhere.

TABLE 3

Total Members of, and Shippers to, the Five Cooperatives, 1952-1957

| | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Shippers | | | | | | |
| Grade A | | | | 407 | 446 | 439 |
| Grade B | | | | 2,007 | 1,513 | 1,327 |
| Total | | | | 2,414 | 1,959 | 1,766 |
| Members | 3,899 | 3,849 | 3,826 | 3,693 | 3,373 | 3,281 |

Source: Records of the five associations.

The associations sell a wide range of dairy products. Their operating statements show sales in 1956 of some 16 products, producing revenues of over $30 million. The products sold are these, though it should not be inferred that any one association sells or produces all of them:

1. Market milk
2. Market cream
3. Manufacturing milk
4. Manufacturing cream
5. Sour cream
6. Ice cream mix and premix
7. Ice cream
8. Butter
9. American cheese
10. Evaporated and condensed milk
11. Whole milk powder
12. Nonfat dry milk solids
13. Evaporated and condensed skim milk
14. Liquid skim milk
15. Cottage cheese and whey
16. Yogurt

The proportion of total sales accounted for by each product varies considerably among the several associations, and also quite markedly for a given association from year to year. In terms of recent averages for the group as a whole, Class 1 sales produce roughly half of total revenues. Sales of manufacturing cream account for about one-sixth of revenues. Another sixth of revenues is accounted for by sales of butter and nonfat dry milk solids. The remaining sixth is contributed in small parts by the variety of other manufactured products--cottage cheese, most notably. Of the four associations that have received Grade A milk over

the years, three sell milk and cream for Class 1 use within the San Joaquin Valley district. Differences among them in ratio of local to total Class 1 sales, however, are appreciable. In 1956 this ratio ranged from 10 to 60 percent.

Output of butter and skim powder represented not only a significant source of association total sales but also a significant part of total production in the State--about one-fourth of the State's butter and powdered skim milk (see Table 4).

TABLE 4

Butter and Skim Powder Produced by the Five Cooperatives, as a Percentage of California Production, 1952-1956

| | 1952 | 1953 | 1954 | 1955 | 1956 |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Butter | 24.7 | 25.1 | 28.5 | 25.6 | 23.8 |
| Skim powder | 9.8 | 22.8 | 28.1 | 25.6 | 22.6 |

Sources: 1) California Crop and Livestock Reporting Service, Manufactured Dairy Products, Milk Production, Utilization and Prices; 1956, pp. 51, 57. 2) Records of the five cooperatives.

As the breakdown of sales may indicate, the activities of the cooperatives fall into four principal categories: 1) Functions associated with transshipment of fluid market milk to metropolitan consuming areas--pickup, receiving, weighing, testing, cooling, holding, assembling, and shipping. 2) The separation and shipment of Grade A and Grade B cream. 3) The manufacture, packaging, and storage of dairy products--principally butter and skim powder--from Grade B and "surplus" Grade A milk. 4) Supplying Class 1 markets within the district (undertaken by only three of the five associations). With fluid milk for retail markets this

implies standardizing, pasteurizing, and packaging. Our concern in this report is primarily with the cooperatives' out-of-district shipments of market milk and market cream.5/

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5/ Professional economists may find this combination of activities somewhat unexpected in light of a theoretical tendency toward zones that ship milk products with different proportions of water. It is in this light that we have just grouped together sales of market and manufacturing cream.

Part of the explanation for the possibly unexpected product mix may be that it represents a transition stage as the milk shed of the metropolitan areas extends. Another part evidently lies in marked seasonal movements in both supplies and demands. Still another part lies in a legal distinction between Grade A and Grade B milk and in enforcement by the State of classified minimum prices in producers' and distributors' Grade A sales. For high-priced, or Class 1, uses this has resulted in excess supply and a substantial influence of historical and institutional factors in the allotment of scarce demand.

Sales of Grade A milk, or its constituents, for ultimate fluid consumption constitute Class 1 sales. Hence, despite our initial grouping of market and manufacturing cream, we proceed to state that our primary interest here lies with sales of market cream and market milk. This grouping is more useful in the present context than would be one that regards the San Joaquin Valley as essentially a zone shipping only milk or only cream. It is heavily committed to both, and total Class 1 sales of milk fat are the immediate interest of the associations that requested this study. We neglect Class 1 skim sales because country plants divert most of their Grade A skim milk to manufacturing uses.

The proportion of total sales of milk fat that is made in the form of cream will remain of interest to economists.

We can calculate the proportion that cream represented of the total bulk transfers of market milk fat from the whole of the San Joaquin Valley to Southern California. The data are in Table 13 of the Dairy Information Bulletin of the California Crop and Livestock Reporting Service. The figure was 42 percent in 1955, 37 percent in 1956, and 38 percent in 1957. The lowest monthly figure in this period was 23 percent in October, 1956; the highest was 57 percent, in July, 1956.

A somewhat different calculation can be made for the cooperatives. We can determine the proportion of total milk fat received that was resold as either market or manufacturing cream; not all the remainder was resold as fluid milk. The proportion varies considerably among the associations, and for a given association over several years. For one association, the figure reached almost 90 percent in 1956; for another, it was less than 30 percent in the same year. But even for the latter association, separation as such is significant. Thus, in 1956 it diverted 23 percent of its receipts of Grade A milk fat to Grade B uses, and half of this became sales of manufacturing cream.

It is apparent that separation and shipment of cream are of decided importance in the San Joaquin Valley. Location theory helps to explain why. No derogation of received analysis is implied in taking a different view here. The issues we wish to consider simply raise questions different from those that location theory is designed to answer.

C. Class 1 Usage

1. Grade A Production.--For regulatory and other purposes, it is customary to distinguish eight milk-producing regions or districts in California--North Coast, North Central, North East, Central Coast, Sacramento Valley, San Joaquin Valley,[6] Sierra Mountain, and Southern California. Southern California has been the leading district in commercial production of Grade A milk, and apparently will remain so for some time (see Figure 2)--but not for more than twenty years if one extrapolates recent trends in Grade A production in Southern California and the San Joaquin Valley.[7]

The San Joaquin Valley is now in second place, accounting for about a third of the State's Grade A milk fat production. In all districts (except the relatively minor North East) Grade A production has been increasing rapidly. Growth in the San Joaquin Valley, however, has been especially rapid. Both its absolute and its percentage rates of growth in recent years--particularly since 1952--are unrivaled among the important dairy districts of the State. Production was nearly 20 percent greater in 1957 than in 1956. Because average fat tests have gradually declined, production of whole milk has grown even more rapidly than has production of milk fat.

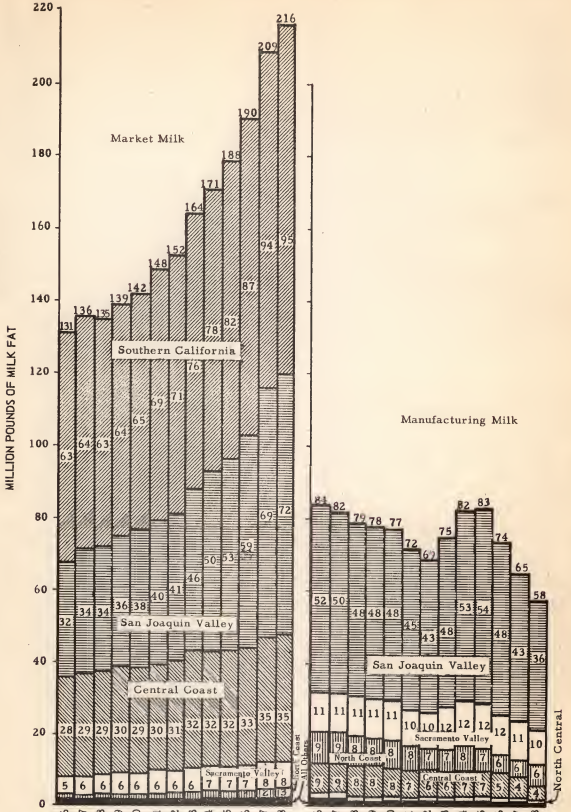
Part of the growth in Grade A production in the San Joaquin Valley has been at the expense of Grade B production. Conversion of Grade B dairies to

---

6/ Encompassing the counties Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare.

7/ Of course, the rate of growth of Grade A production in the San Joaquin Valley may slacken as conversion of Grade B dairies to Grade A production diminishes or if sufficient Class 1 outlets do not develop. Southern California production is closer to the southern metropolitan markets, but faces different input costs and different competing uses for land. It appears that Los Angeles distributpors have in recent years increased the quotas or shipping rights of their Southern California suppliers proportionately more than those of their suppliers in San Joaquin Valley.

Figure 2. Commercial Production of Milk Fat in California, by Districts, 1946-1958.




Sources: 1) California Crop and Livestock Reporting Service, California Dairy Industry Statistics for 1956. Manufactured Dairy Products, Milk Production, Utilization and Prices, Tables 13, 14.
2) California Crop and Livestock Reporting Service, Dairy Information Bulletin, 1957, 1958, Vols. XIV, XV, Tables 7, 8.
3) 1958 annual figures estimated by the authors.

Grade A production has been encouraged, where outlets were available, by the rather large differential between Class 1 and Grade B prices in recent years--particularly since 1953 (see Table 5). Decreases in Grade B production, however, account for only part of the growth in Grade A production--partly because conversion to Grade A production is often accompanied by an increase in production.

TABLE 5

Average Prices Paid Producers for Milk, 1948-1957. (Dollars per 100 pounds of 3.8 percent milk, f.o.b. plant; simple average of monthly prices.)

| Year | Average Class 1 fluid milk prices, Los Angeles and San Francisco marketing areas | Manufacturing milk prices, five San Joaquin Valley plants | Difference (1-2) | Difference in manufact. milk price (3÷2) |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 1948 | $5.35 | $4.26 | $1.09 | 26% |
| 1949 | 5.08 | 3.32 | 1.76 | 53 |
| 1950 | 4.66 | 3.26 | 1.40 | 43 |
| 1951 | 5.25 | 3.99 | 1.26 | 32 |
| 1952 | 5.91 | 4.46 | 1.45 | 33 |
| 1953 | 5.70 | 3.96 | 1.74 | 44 |
| 1954 | 5.13 | 3.33 | 1.80 | 54 |
| 1955 | 5.12 | 3.36 | 1.76 | 53 |
| 1956 | 5.27 | 3.47 | 1.80 | 52 |
| 1957 | 5.29 | 3.58 | 1.71 | 48 |
| 1958 | 5.19 | 3.40 | 1.79 | 53 |

Source: California Crop and Livestock Reporting Service, Dairy Information Bulletin, Vol. XIII, No. 8, November, 1956, p. 20. Figures for 1957 and 1958 estimated by the authors.

It has been mentioned that all five of the cooperatives studied now receive Grade A as well as Grade B milk. In recent years they have handled an increasing share of the rapidly growing Grade A production in both the San Joaquin Valley and the State. In 1956 the respective shares had reached 19.4 percent and 6.1 percent (see Table 2). Thus the cooperatives have had a growth rate above average in a leading district. The recent record of their milk receipts is portrayed in Figure 3.

| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|
| [illegible] | 61.6 | 84.8% | 8.0% | [illegible] |
| [illegible] | .106 | 0.20 | [illegible] | [illegible] |
| [illegible] | 0.62 | 1.2C | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
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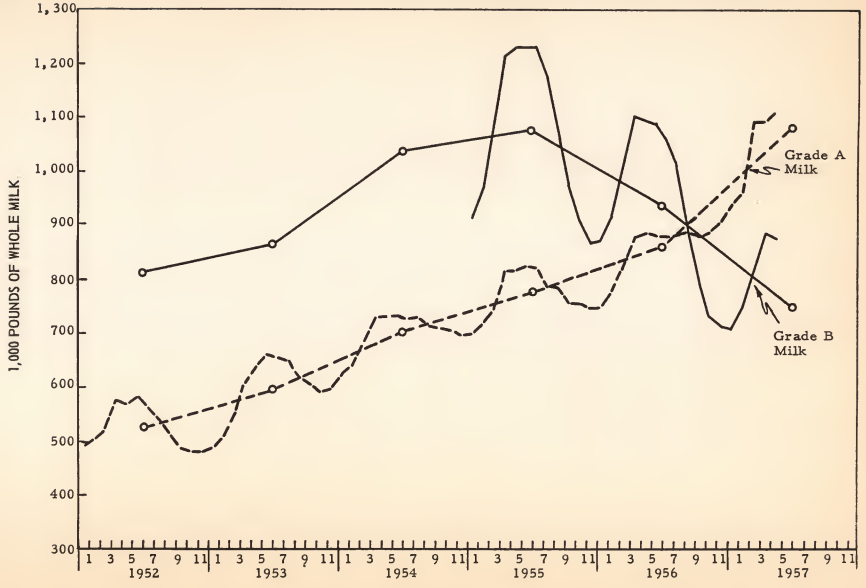
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

Figure 3. Average Daily Receipts of Milk by the Five Cooperatives, 1952-1957.




Source: Records of the five associations; 1957 annual figures estimated by the authors.

In 1957 the number of producers shipping Grade A milk to the cooperatives stood at 439 (see Table 3). The number of Grade A shippers has recently moved irregularly and without definite trend (except for the association that started receiving Grade A milk only recently). Consequently, the growth in the cooperatives' Grade A receipts is explained by increased receipts per shipper, not by an increase in the number of shippers. Per-shipper data for all five associations (less the one initiating Grade A receipts in 1956) are available only since 1955; these and comparative data are presented in Table 6.8/

TABLE 6

Annual Receipts of Whole Milk by the Cooperatives, Per Shipper, in Thousand Pounds, 1954-1956

| | 1954 | 1955 | 1956 |
|---|---|---|---|
| | 1 | 2 | 3 |
| Grade A | | | |
| Three associations | 675 | 774 | 829 |
| Four associations | | 694 | 705 |
| Grade B | | | |
| Four associations | 186 | 194 | 236 |
| Five associations | | 195 | 227 |

Source: Records of the five associations.

8/ The amount received per shipper has been increasing for all four associations at a rate much faster than is suggested by the two observations in Table 6. Table 6 shows a modest increase between 1955 and 1956 in the Grade A mean for all four associations taken together. Actually, for three of the four associations, the mean declined. The fourth had a sizable increase that carried the group mean upward. This combination of contrary movements has prevailed since 1952.

We have data to calculate the mean for two associations since 1952, for three since 1954, and for four since 1955. The latter two means are presented in Table 6. In each instance the group mean shows a definite, though once slightly irregular, uptrend. Yet if we refer to the individual series, only one of the four associations had a definite uptrend, and that was irregular, having two declines and four increases between 1950 and 1956. The other individual series actually show more year-to-year decreases (four) than increases (three). The increases, however, average appreciably larger than the decreases. It is this that produced the rapidly rising series for the three associations, and leads us to say that the amount of Grade A milk received per shipper has been increasing, and at a rate much faster than is suggested by the two observations for all four associations.

Because growth in the cooperatives' Grade A receipts is explained by increased receipts per shipper, we cannot attribute the "surplus" problem facing the cooperatives to an accumulation of converted Grade B shippers in the cooperatives' Grade A pools. Conversions of dairies already delivering Grade B milk have occasionally been quite notable, and are often accompanied by increases in production. But conversions have evidently been offset by cancellations, since the number of Grade A shippers has not been growing. This is not to affirm or deny that transfers to the Grade A pools have been permitted at--in some sense--a judicious pace. Without the transfers that have occurred, the number of Grade A shippers would presumably have been smaller, as has apparently been occurring with proprietary distributors. We merely say that the facts do not support the great emphasis that some persons have placed on the supposed special willingness of these cooperatives to accept increasing numbers of Grade A shippers.9/

On top of the annual movements in Grade A production already discussed, is the seasonal pattern. With Grade A whole milk production, the seasonal pattern is quite regular for both cooperatives and the Valley as a whole.10/

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9/ The pooling systems of the cooperatives, including provisions for entry into the Grade A pools by new members and by former Grade B members, are the most important aspect of the associations' membership relations. They are critical to internal distribution of the burden of the cooperatives' "surpluses" and are one of the rather few problems related to milk marketing in the San Joaquin Valley that are unique to the cooperatives. The cooperatives would be well advised to keep an eye on the appropriateness of their pooling procedures. Omission of this topic from the present report reflects emphasis on marketing problems, not the importance of the topic.

10/ Seasonality in the production of Grade A and Grade B whole milk appears to be attributable primarily to disproportionate freshening in late winter and spring (after freshening, production will grow for a month or two and then gradually decline), and to the differential availability and quality of forage and feed at different times of the year. Both of these factors are largely price-motivated. Thus, production increases with feed, and feed is scarcer and more costly in the fall and winter. Seasonal price variation and base-surplus pricing schemes pull in the opposite direction.

Mean daily production of whole market milk is regularly relatively high in the spring and summer, peaking in June or July, and low in the fall and winter, usually troughing in December (see Figures 3 and 4, in which monthly rates are corrected for the varying number of days per month.)

Market milk fat, however, shows little seasonality. Figure 3 implies that the seasonal pattern in an average fat test is opposite to that in whole milk production, as in fact appears in Figure 5.[11] The common notion of short and flush seasons holds for the skim derived from market milk, but not for the fat.

---

11/ From calendar 1952 through calendar 1956, the ratio of June-to-December Grade A fat test for the San Joaquin Valley ranged from 88 to 90 percent, with a mean of 89 percent. In the case of Grade A whole milk production in the Valley, the ratio of December-to-June mean daily production ranged, for calendar 1952 through calendar 1957, from 83 to 96 percent, with a mean of 91 percent--despite the uptrend. Because whole milk production has, on the average, dipped in December less than the fat test has risen, Figure 4 shows that fat production has increased even during the fall and winter.

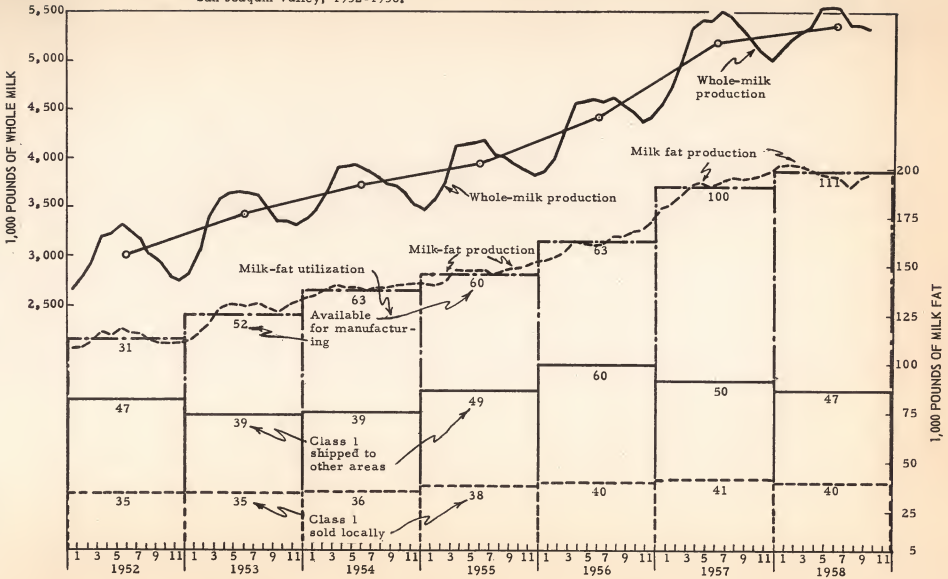
The seasonality in average fat test apparently results from the fact that, though fat and other milk constituents move up together and then gradually down, after freshening, percentage of change is greater in the former than in the latter. Hence the fat test tends to move inversely to whole milk production.

Three other points of interest are shown by Figure 3. One is that the San Joaquin Valley has participated in the well-known downtrend in fat tests. In fact, a comparison would show that the San Joaquin Valley fat tests reach given levels about three years ahead of statewide averages.

The second point is that the trends and seasonal patterns in fat tests are quite similar for Grade A and Grade B production. The third is that the fat test in the San Joaquin Valley has consistently averaged less for Grade A milk than for Grade B milk--though the difference is narrowing fairly rapidly.

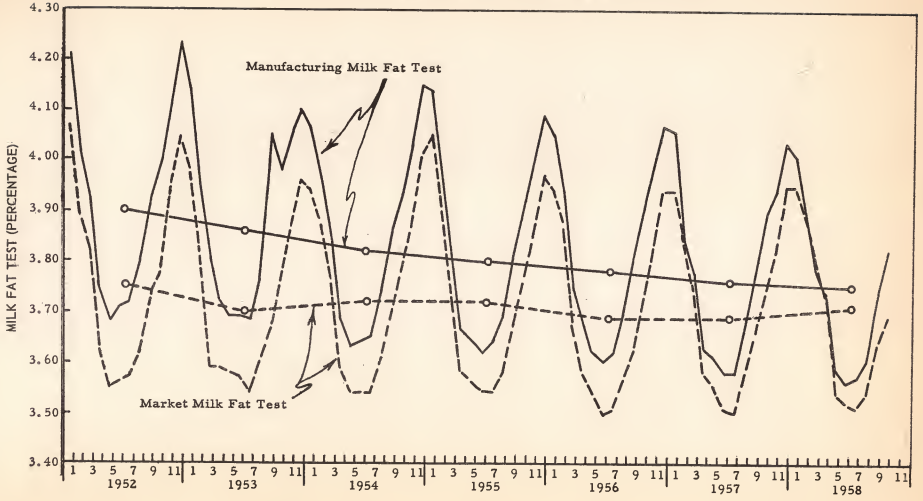
The lower average fat test of Grade A milk than of Grade B milk (shown in Figure 3), as well as the downtrend in both, is apparently the result of greater proportions of Holsteins in the herds and smaller proportions of Jerseys and Guernseys. The change in breeds and the lead for Grade A herds are evidently a response to better producer prices and the better salability that accompanies low-test production. Better salability is reflected in greater ability of producers with low tests to obtain Grade A contracts. Better prices are often a concomitant of separate pricing of fat and skim components. In turn, these differences in producer returns reflect both a shift in consumer tastes away from high-fat products and a greater use of cartons and homogenization.

Figure 4. Average Daily Production of Whole Market Milk and Production and Utilization of Market Milk Fat, San Joaquin Valley, 1952-1958.




Sources: 1) California Crop and Livestock Reporting Service, Dairy Information Bulletin, Vols. XI-XV, 1954, Tables 8, 13.
2) 1958 annual figures estimated by the authors.

Figure 5. Milk Fat Test Percent, San Joaquin Valley, 1952-1958.




Sources: 1) California Crops and Livestock Reporting Service, Dairy Information Bulletin, 1954-1958, Vols. XI-XV, Table 13.
2) 1958 annual figures estimated by the authors.

2. Grade A Disposition.--Grade A milk produced in the San Joaquin Valley may find a Class 1 use within the district (as it does, in part, for three of the associations) or, more often, in one of the nearby metropolitan areas--principally the San Francisco Bay area, the Sacramento area, and especially the Los Angeles area.[12] The excess over Class 1 usage, including Grade A skim milk resulting from sales of market cream, is turned to manufactured dairy products.

The disposition of Grade A production is not uniform through the year. For the cooperatives and for the Valley as a whole, both local and distant Class 1 sales are greatest in the fall and least in the spring (see Figure 6).[13]

The swings are by no means smooth; for given months, sales may advance one year and decline the next. This is especially true of the seasonal swing in out-of-district sales, which shows less regularity and greater absolute and proportionate variability than that in local sales (see Figure 7). Since the seasonality in Grade A production does not offset that in Class 1 use, diversion to manufacturing naturally shows an opposite seasonal pattern to that in sales; the "surplus"--Grade A milk available and used for making dairy products for which Grade B milk is legally acceptable--fairly regularly peaks in the spring and troughs in the fall, proportionately as well as absolutely (see Figures 10 and 11).

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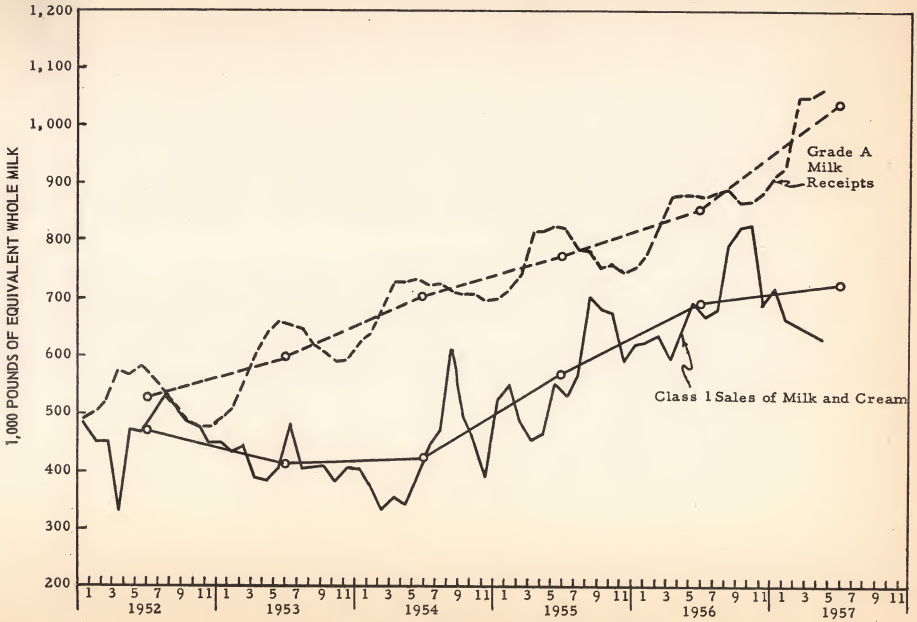
12/ The San Joaquin Valley is an important supplier to Los Angeles. In recent years market milk fat transferred from the San Joaquin Valley has represented 15 to 20 percent of Class 1 usage in the entire Southern California district.

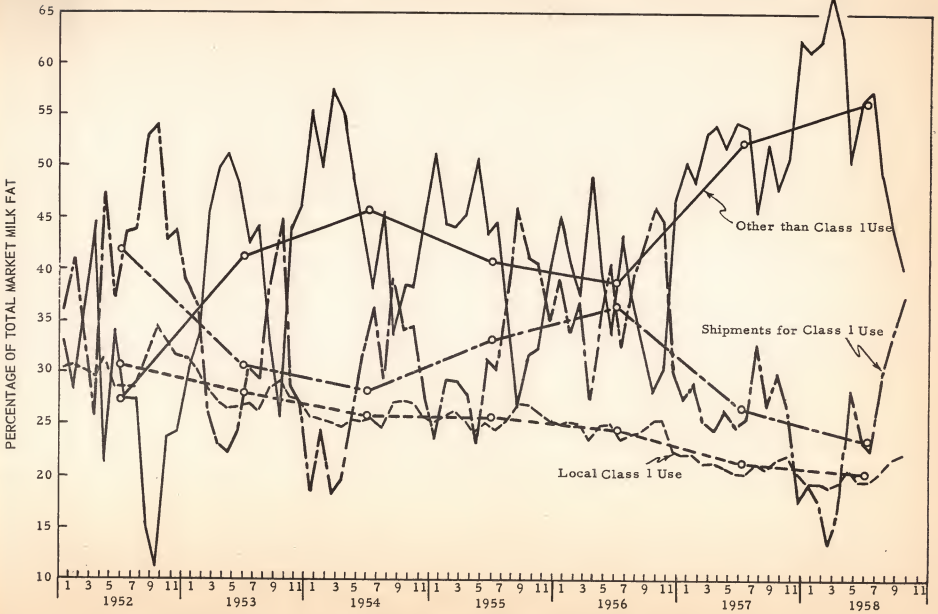
13/ By calendar years from 1952 through 1956, the ratio of the cooperatives' April-to-October Class 1 sales ranged from 66 percent to 95 percent, with a mean ratio of 74 percent.

Figure 6. Average Daily Receipts and Sales of Market Milk by Four Cooperatives, 1952-1957.




Source: Records of the four cooperatives, extrapolated to obtain annual means for 1957.

Figure 7. Proportionate Utilization of Market Milk Fat Produced in the San Joaquin Valley, 1952-1958.




Sources: 1) California Crops and Livestock Reporting Service, Dairy Information Bulletin, 1954-1958, Vols. XI-XV, Table 13.
2) 1958 annual figures estimated by the authors.

In terms of annual movements, local and distant Class 1 sales for the San Joaquin Valley have behaved differently, as is apparent from Figure 4.

Local Class 1 usage has increased steadily for the Valley as a whole, at least until 1958. Nevertheless, the rate of increase has been less than the rate of growth in the Valley's Grade A production. As a result, local Class 1 usage as a proportion of production has declined. In 1957 it accounted for only about 20 percent of the Valley's Grade A milk fat production (see Figure 7). The cooperatives have participated to only a limited extent in the growth of local Class 1 sales that has occurred. There are different trends among the cooperatives that sell within the district. One shows steady and substantial growth; another varies up and down, without apparent trend.

Out-of-district shipments for Class 1 use have moved irregularly in recent years. This is true of both the cooperatives and the Valley as a whole. Out-of-district shipments increased after 1954, but declined sharply in 1957 and 1958, somewhat earlier than did indexes of national economic conditions (which started down in about September, 1957, and touched bottom in about April, 1958). This decline, added to the growth in production, reduced out-of-district shipments to only about 25 percent of the Valley's Grade A milk fat production in 1957.

It is these variations in out-of-district sales that explain the sharp variations from season to season and year to year in both absolute and proportionate Class 1 use. More exactly, the explanation lies in variations in out-of-district sales of market milk. Sales of market cream have moved differently, both seasonally and annually. Seasonally, sales of market cream peak in about May and trough in about January. Annually, sales of market cream have grown with Grade A receipts, and sometimes faster. That this

growth has not solved the problems of "surplus" Grade A milk fat is explained by the relatively small amount of cream sales; in the cooperatives, cream sales amount to only about 15 percent of the combined annual Class 1 sales of milk fat. In addition, of course, the remaining skim milk is used for manufactured dairy products.

The result of the variation of out-of-district sales of market milk was that, for both the cooperatives and the Valley as a whole, total Class 1 usage relative to production fell from 1952 until mid-1954. It then rose appreciably until the beginning of 1957, with sales growing so much that they almost overtook receipts by October, 1956. With the new year, sales started downward and receipts grew even faster than before.[14] The same pattern appears in proportionate Class 1 usage for the State as a whole (see Figure 8). The State's proportionate usage, however, is invariably both greater and more stable.[15] The decline in the Valley's out-of-district shipments in 1957, plus the reduced proportion of local Class 1 usage, left over 50 percent of the Valley's Grade A milk fat production as "surplus." California as a whole had 17 percent.

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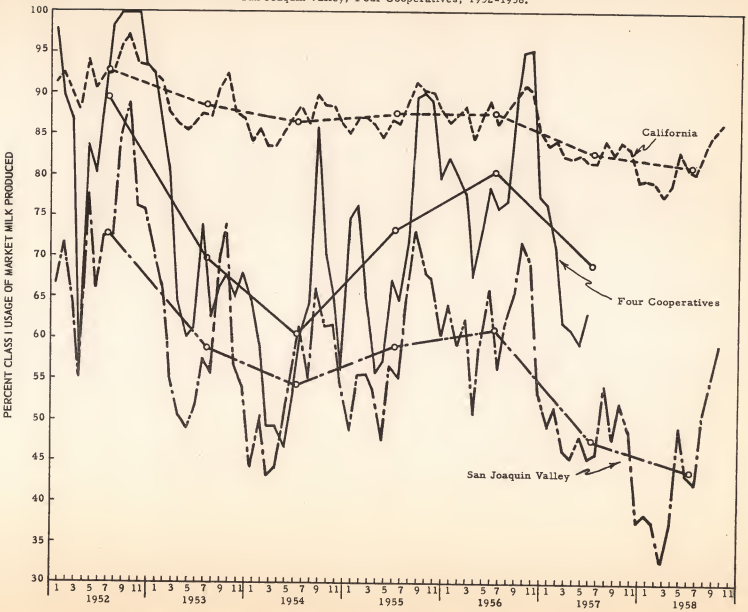
14/ There is one exception among the cooperatives. The downturn in 1957 did not occur for one association. Its market milk sales were indeed plunging. But its market cream sales were skyrocketing to unprecedented heights. In June, 1957, when our data end, the fat content of market cream sales reached more than three times the fat content of market milk sales.

15/ Both seasonal and annual swings were quite large for the cooperatives in the period January, 1952, to June, 1957. For the associations collectively, the lowest proportionate Class 1 use in any one month was 46 percent (in May, 1954), and the lowest proportion in any one year was 60 percent (in 1954). For individual associations, the lowest proportion for any one month ranged from 7 percent to 49 percent (two of the four lows occurring in 1954), and the lowest proportion for any one year ranged from 36 percent to 71 percent (all four lows occurring in 1954). The highest figure in any one month was 100 percent for the group and for each association (in the fall of 1952). The highest figure for any one year was 90 percent for the group and 79 percent to 93 percent for individual associations (all in 1952).

Figure 8. Class 1 Usage of Market Milk Fat Relative to Production California, San Joaquin Valley, Four Cooperatives, 1952-1958.




Sources: 1) California Crop and Livestock Reporting Service, California Dairy Industry Statistics for 1955, 1956, 1957. Manufactured Dairy Products, Milk Production, Utilization, and Prices Table No. 13.
2) California Crop and Livestock Reporting Service, Dairy Information Bulletin, Vols. XI–XV, Tables 2, 13. 1958 annual figures estimated by the authors.
3) Records of the four associations; 1957 annual figures estimated by the authors.

Nevertheless the cooperatives appear to have done appreciably better than the average for the San Joaquin Valley as a whole in finding Class 1 outlets for a large proportion of their receipts of Grade A milk fat. Their annual average Class 1 proportions apparently exceeded those for the Valley as a whole in every year from 1952 through 1956 (see Figure 8). The Valley average was apparently bettered by two of the four associations in all five years; by one in four years, and by one in three years. Conversely, the Grade A proportion of the total milk fat used in manufacturing dairy products appears to be substantially smaller for the cooperatives as a group (under 15 percent in 1956) than for the San Joaquin Valley (over 30 percent in 1956).

The amount of difference between the cooperatives and others in the Valley in proportionate Class 1 usage may be even greater than appears from comparing (Figure 8) the series for the cooperatives with that for the Valley as a whole. The Valley series is, of course, elevated by the cooperatives' performance. It (and to a degree the State series) is probably also elevated somewhat by counting some Grade A production as Grade B when no Class 1 outlet was found. On the other hand, the guarantees of Class 1 usage obtained from proprietary distributors will have worked in the opposite direction in terms of actual payments to producers.16/

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16/ We are somewhat hesitant about comparing the series on proportionate Class 1 usage for the cooperatives with the corresponding series for the San Joaquin Valley and for California as a whole, for a reason additional to the probable overestimate of the latter two. The California and San Joaquin Valley series are calculated directly from data on the production and sales of market milk fat as reported by the Bureau of Milk Control. The cooperatives' series is calculated from data on whole milk production and equivalent whole milk sales as supplied to us by the cooperatives.

We are confident that the series for the cooperatives is internally consistent, and comparable at least as to whether one year was higher than another. But it remains possible that the absolute level may not be comparable with that of the other two series, and that its seasonal fluctuation may be exaggerated by a failure to use the correct, and seasonally varying, fat test in the calculation of equivalent whole milk sales. The first possibility seemed sufficiently important to run a check on calculation procedure.

(Footnote continued on next page)

(Footnote 16/ continued.)

We were able to calculate an annual Class 1 proportion directly from milk fat data for one association for 1954, 1955, and 1956, and for a second association for 1955 and 1956. The two are the leading associations in Class 1 sales between them accounting for 77 percent of the cooperatives' combined Class 1 sales in 1956. We then compared these five annual figures with five obtained by the method that produced the cooperatives' lines in Figure 8. The latter were higher in two instances and lower in three. In four instances the difference between the figures was less than one-fourth of one percent of the larger. In the fifth instance the difference was 2 percent of the larger figure.

We therefore feel that the annual figures for the cooperatives in Figure 8 are substantially reliable and comparable with the corresponding figures for the San Joaquin Valley and the State.

Though the cooperatives' average Class 1 usage appears to have exceeded that for the Valley as a whole, the associations nevertheless clearly share the problems arising from the fact that the San Joaquin Valley produces a disproportionate part of the State's "surpluses." The cooperatives' proportionate Class 1 usage appears to move along about halfway down from the State average toward the Valley figure. For California as a whole, 87 percent Class 1 usage would be a representative result in recent years, whereas the figure would be 58 percent for the San Joaquin Valley and 73 percent for the cooperatives.

3. The Incidence of "Surpluses."--"Surpluses" of Grade A milk fat in a milkshed occur for three rather distinct reasons, leading to the designations "chronic surplus," "seasonal surplus," and "standby surpluses." All three are defined with reference to certain price levels, since the difference between production and Class 1 sales in a milkshed would vary--and perhaps disappear--depending on prices.

"Chronic surplus" is the amount by which Grade A production in the month of greatest proportionate Class 1 usage (September or October) exceeds the amount that would find Class 1 use if Class 1 producer prices equaled regulatory minima (if there are such) or (in the absence of regulatory minima) equaled Grade B prices at marginal locations.[17] During the last

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[17] We are not defining "surplus" as the amount of excess supply at a prevailing but disequilibrium level of price. There will be "surplus" Grade A production if part of it is bought for manufacturing, even if Class 1 prices are in equilibrium--that is, low enough to make manufacturing use no disadvantage to the producers of the "surplus." However, the two definitions would be equivalent if regulatory price minima are set at levels that make Class 1 usage preferable to every Grade A producer even though there is, at those levels, an excess supply going to manufacturing.

few years "chronic surplus" has again developed in California milksheds.[18] Since 1952 there has been a widening absolute, and often even percentage, gap between Grade A production and Class 1 use even, in the fall months (see Figure 8).

"Seasonal surplus" is the amount by which Grade A production, if it were roughly equal to (say, within five percent of--see October 1952 in Figure 8) Class 1 sales during the month of greatest proportionate Class 1 usage, would in other months, because of seasonal shifts in supply and demand, exceed Class 1 sales if Class 1 producer prices equalled regulatory minima or (lacking them) Grade B prices. In recent decades the amplitude of seasonal fluctuations in Grade A production has been substantially reduced by price-motivated changes in production practices (especially freshening and feeding practices). Class 1 sales, however, fluctuate widely. despite some price variation, and in each year some "seasonal surplus" has existed.

"Standby surplus" is the amount by which Grade A production, if it were roughly equal to (say, within five percent of) Class 1 sales on the day of the week with peak producer sales, would exceed consumption on other days of the week because of day-to-day variations in consumption at prevailing prices. The pattern of these variations may be irregular--reflecting changes in temperatures or in tourist traffic. Or they may be

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18/ This condition prevailed in California during the thirties. The reasons were a) a drastic decline in consumer buying power from widespread unemployment and sharp reductions in wages, b) a stickiness in retail prices for milk, c) a failure in many milk markets of the negotiated prices paid to market milk producers to decline in relation to prices paid to producers of manufacturing milk, and d) a lack of profitable alternatives open to producers. Correction of this situation was protracted and painful. Balance between production and consumption was not restored until World War II. (During the war, production at times failed to meet demand at prevailing prices.)

quite regular and rather predictable, as is the case with the development in recent decades of a concentration of retail-store purchases of food--including milk and cream--on Fridays and Saturdays, encouraged by the offering of "weekend specials." In either event, sales volume, not prices, tends to fluctuate under existing arrangements, and distributors aim at securing enough milk to meet peak demands. Since production remains fairly steady from day to day, the day-to-day fluctuations in sales imply diverting off-peak "standby surpluses" or accumulating supplies over the early days of the week to meet weekend sales, or both (see Part D, below).

As the structures of the principal Grade A milk markets in California have developed, distributors in the San Francisco and Los Angeles areas have secured the bulk of their milk supplies from producers situated within, say, 100 miles of the metropolitan areas. For more than 40 years the San Francisco area, and more recently the Los Angeles area, has regularly obtained annual, seasonal, and weekly supplemental supplies from producers in the San Joaquin Valley. The result has been a concentration (though not a complete one) of the several kinds of "surplus" in the San Joaquin Valley.

This is an efficient result, since, if some Grade A production will be "surplus," that in the Valley is the most costly to ship to market and the most economical to process, along with Valley Grade B production, into manufactured dairy products. It is also the result that would prevail under pure competition; producers more distant from a market would be closer to manufacturing facilities and would tend to have no fluid usage until closer producers had 100%. This is the effect of the smaller cost of

transporting manufactured dairy products than of transporting the equivalent amount of whole milk.[19]

It is important to notice, however, that pure competition would not imply that more-distant producers would bear a disproportionate burden from the geographic concentration of "surpluses."

Given pure competition, the onset of a "surplus" would be associated with excess supply, and Class 1 price (f.o.b. Los Angeles) would therefore be reduced enough to bring Class 1 sales and Grade A production into balance, or even to the point where manufacturing is actually the more attractive use for all Grade A production "surplus" at the lower price. The interaction of supply and demand each day would establish prices (f.o.b. Los Angeles) that would clear the Grade A supply.

Though Class 1 prices (f.o.b. Los Angeles) would fluctuate, they would nevertheless tend, net of location differentials, to be equal at any given time for all Grade A producers. Pure competition would imply equal access to Class 1 outlets for all. As a result, producers of Grade A milk of given quality located closer to Los Angeles could not consistently command a significantly higher average price (f.o.b. Los Angeles) or other advantage over that which more-distant producers could obtain if they chose; if such appeared, distributors would turn to the more-distant

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19/ Concentration of "surpluses" in the Valley is efficient and competitive, however, only if costs of producing market milk nearer to the market are not greater than costs in the Valley by enough to offset the saving in transportation. A quasi-automatic process of accomplishing this condition exists if business-men have the right to try to create a market for their commodities by making the transaction attractive to free customers. Under competitive conditions, if there is excess supply at prevailing prices, prices decline and the lower-cost (or financially strong) producers survive.

producers. Consequently, even when Los Angeles Class 1 prices fell at the onset of a "surplus," prices to more-distant producers (f.o.b. the ranch or Los Angeles) would tend to fall no more than would the prices received by closer producers--whether or not manufacturing became a more attractive outlet to some or all of the more-distant producers.

More exactly, prices to Valley producers would tend to fall precisely as much as prices to closer producers fell if both manufacturing and bottling facilities were in Los Angeles; there would then be no reason for at-ranch prices received by differently located Grade A producers to differ by anything but transfer costs. In fact, however, the location of manufacturing facilities only in the Valley alters the situation. It implies that, with pure competition, Valley Grade A producers would tend to suffer less than closer producers from reductions in Class 1 prices (f.o.b. Los Angeles) during flush periods. That is, Valley producers would suffer less whenever the reduction in prices is sufficient to make manufacturing more attractive to some or all of the Valley producers who previously had Class 1 outlets; the at-ranch prices received by most of the producers would fall less than the full amount that Class 1 prices would have fallen.[20/]

In particular, their at-ranch prices would fall by only the amount that Class 1 prices previously had exceeded Grade B prices in their vicinity

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20/ "Most" here means all except producers supplying the country plant so close to the market that nothing less than a full fall in Class 1 prices would induce it to divert Grade A milk to manufacturing.

(plus the amount of any induced decline in Grade B prices). Since manufacturing has become the more attractive outlet to these producers, this price reduction must be less than the reduction in Class 1 prices, though the latter is the reduction suffered by producers closer to Los Angeles, but farther from manufacturing facilities, who continue to find fluid use the highest-priced alternative.

The outcome with pure competition, then, is that Valley producers would periodically or perpetually have smaller proportionate fluid utilization than closer producers, but they would have no disproportionate burdens therefrom--indeed, often less than proportionate burdens.

It is doubtful whether some approximation to the purely competitive result would actually obtain if existing price controls were scrapped. "Surpluses" would probably persist for some time, though perhaps reduced by lower Class 1 prices; bargaining associations would probably play a prominent role; and any burdens associated with "surpluses" might be distributed in a number of ways. Classified pricing and individual plant pools long antedate price controls in California.

It is clear, however, that existing price-control machinery has the effect of placing a disproportionate part of burdens associated with "surpluses" on producers in the San Joaquin Valley. It does so by non-use of market-wide (or state-wide) pooling in the determination of (minimum) blend price to the various Grade A producers who serve the Los Angeles and San Francisco Class 1 markets. With market-wide pooling, the burden of receiving Class 2 and Class 3 prices instead of Class 1 prices for "surplus" production would be prorated over all Grade A producers who serve a market. Under existing interpretation of the

milk price-control laws[21] a distributor must pay Grade A producers uniformly with respect to the "surplus" only if their milk is physically commingled--which implies that the milk is received at the same plant.[22] With plant pools (as would be true to a lesser degree with company-wide pools), the burden is concentrated on the producers whose milk is in fact, on the basis of disposition by the receiving plants, turned to manufacturing.

As among receiving plants, the proportion of Class 1 usage obtained by the Valley cooperatives and by the country plants of proprietary distributors as a group is consistently smaller than that obtained by distributors' metropolitan plants as a group. As a result, the Grade A producers--usually closer in--who deliver directly to the metropolitan plants and therefore participate in these plants' Grade A pools, consistently receive higher blend prices than do other producers--usually those in the Valley--who serve the same market at peak periods.[23]

This disproportionate burden on Valley producers should not be confused with the penalty for seasonal variations in production under base-surplus pricing plans, with the cost of country-plant handling, or with the location differential--the difference in the price of a given

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21/ Chapter 17, Division 6 of the Agricultural Code of California, which provides for state control of producer and resale prices for milk and certain milk products.

22/ As matters stand, if a distributor were to fulfill the conditions for paying all his Grade A suppliers uniformly, he would have to ship his Valley production to the city plant, where it would be physically commingled, and then transport the "surplus" back to the manufacturing plant in the Valley.

23/ This holds for payments for actual Class 1 usage of milk fat; it holds even more, in view of larger Class 1 guarantees, for total payments for Class 1 usage of milk fat; and it holds still more for total payments for Class 1 usage of both milk fat and skim milk.

quality of milk at different ranches or country plants because they are located at points that are economically different distances from a common market. With existing control machinery, these charges are additionally deducted from minimum Class 1 prices (f.o.b. the market) in calculating Valley producers' payments.

Furthermore, each of these charges can (or could in the past) be justified as supplying incentives for economical production and marketing practices--an incentive to avoid seasonality in production contrary to that in demand; an incentive to operate facilities for assembling milk collected in 10-gallon cans and transshipping some of it in large tanks; and an incentive to locate dairying where costs of production and of transportation are minimized.

In contrast, the disproportionate burden of "surpluses" borne by Valley producers may create incentives working against efficient production and marketing. It may place sites and firms in the San Joaquin Valley at an artificial disadvantage--one unrelated to costs--thereby giving further impetus (beyond that implicit in setting minimum prices) to the location of dairying close to metropolitan areas. More exactly, it may give extra encouragement to dairy farms, usually close in, that ship directly to city plants, and especially to those that have obtained relatively favorable contracts and guarantees from distributors. Production may be rigidified at these locations. It could pay a new dairyman to buy such farms even though costs there are higher than elsewhere. Efficient producers in the Valley may fail while inefficient close-in producers prosper because they had the good fortune to obtain shipping rights. The disproportionate burden may also artificially discourage direct shipment of milk from ranches to metropolitan plants even where such would be economical, since distributors--especially if influenced by the bargaining

associations of direct shippers--may be reluctant to circumvent the country plants and enlarge the participants in the pools of their metropolitan plants. We do not assert that these results have in fact occurred, but we do think they are distinct possibilities.

Of course, how the burden of "surpluses" should be divided is a question of equity, or "fairness," and is therefore subjective. This does not mean, however, that it is entirely unamenable to economic analysis. "Fairness" in our culture is a subjective value whose application is usually objective. "Fairness" usually means equal treatment to all except where unequal treatment is justified by differences among the parties that are relevant to the attainment of greater efficiency (or relevant to their previous sacrifices). That is, the question of efficiency is often an integral part of the question of equity, and if so, economic analysis is quite relevant. It appears to the authors that the incidence of "surpluses" under the prevailing application of California's milk price-control legislation may not be justified by considerations of efficiency, but rather may tend to impair efficiency. If so, those who value either equity (as defined) or efficiency would have an objective basis for evaluating the situation. Since it is our impression that both equity and efficiency are important values to the control authorities, we suggest that it might be well for them to re-examine the question of the incidence of "surpluses."

It should be added that our remarks pertain to the existence and justifiability of unequal treatment of two groups of producers, not to the advisability or nature of specific means of removing this inequality.[24/]

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24/ With respect to the advisability of any means of equalization, it should be mentioned that there may be differences among the producer groups in previous sacrifices--part of the concept of fairness as defined above. Some producers have purchased or cash-rented their dairies since the incidence of "surpluses" under plant pooling became evident. Presumably they will have agreed to prices that at least partly offset the advantages or disadvantages of their ranches' particular marketing situations. They will have paid for their premises less than they would otherwise have paid if the burden of "surpluses" made the ranch less profitable, and they will have paid more where they were in effect acquiring "shipping rights" that gave them a desirable Class 1 outlet.

Unwise inequalities can be repaired by unequally lowering both the high and the low to a new low level, by unequally raising both low and high to a new high level, by lowering the high to the level of the low, by raising the low to the level of the high, or by raising the low and lowering the high to a common intermediate level. Market-wide or state-wide pooling would tend to accomplish the last, and we have mentioned these possibilities. But we have also mentioned pure competition, and if price controls were abandoned and some approximation to pure competition resulted or were compelled, the first-mentioned means of equalization would tend to follow, at least while "surpluses" are present--that is, a reduction in the blend prices being received by all Grade A producers, including those presently bearing a disproportionate part of the burden of "surpluses." There are also possibilities of partial alleviation by, among other things, providing special minimum prices for stored milk. Our analysis is directed at questioning the inequality, not at supporting a particular solution or at suggesting that blend prices to San Joaquin Valley producers are, in an absolute sense, too high or too low; these are questions beyond the scope of the present report.25/

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25/ These and related questions have been excellently analyzed by D. A. Clarke, Jr. See especially his Fluid Milk Price Control in California, Special Report to the Joint Legislative Committee on Agriculture and Livestock Problems (Senate of the State of California, 1955). Clarke recommends (p. 96) "a system of open market-[wide] pools, including provision for free selection of pool by both producers and plants." See also, the proposals of R. G. Bressler, "Pricing Raw Product in Complex Milk Markets," Agricultural Economics Research, October, 1958, vol. X, No. 4, pp. 113-130.

D. Grade A Storage

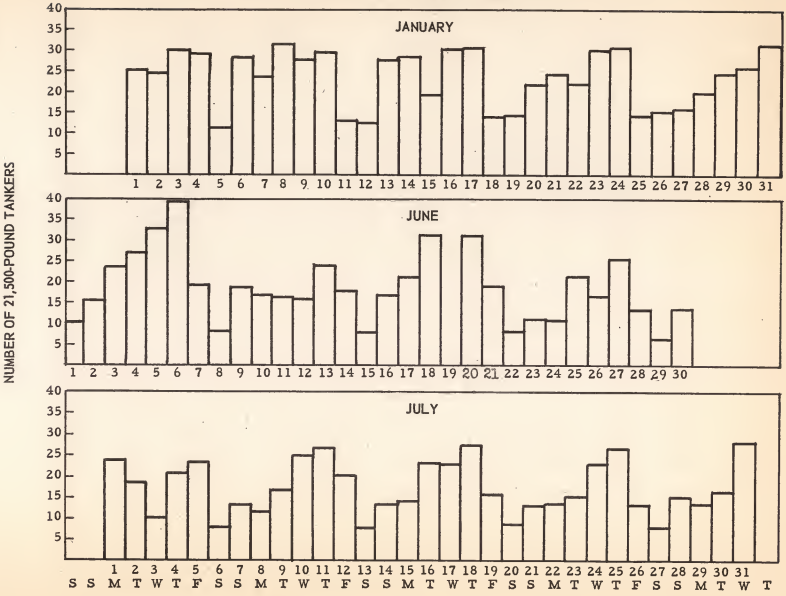
Reference has already been made to the variability from day to day in out-of-district shipments of market milk by the cooperatives. This is in part a reflection of the concentration of "standby surplus" in the San Joaquin Valley.

Figure 9 shows that the day-to-day variations are neither regular nor smooth. If data for the four individual associations involved were plotted separately, they would appear still less regular. The totals in the figure, however, bring out the fact that there is a weekly cycle in the cooperatives' out-of-district shipments. The normal pattern consists of a persistent, but unequal, increase in shipments from a Saturday low to a Thursday high, followed by a persistent, but again uneven, decrease back to a Saturday low.

Saturday is nearly always the day of smallest shipments for the week, not only for the total shipments shown in Figure 9 but also for the associations individually. Thursday appears from Figure 9 to be almost as regularly the day of greatest shipments for the week. Actually, this regularity holds for only two of the four associations. For the other two, it can be said only that Thursday is never very low and that no other day is more often the peak day. Thursday represents a one- or two-day lead on Friday and Saturday retail traffic.

The unevenness of both the rise before Thursday and the fall after it represents a tendency for shipments on Tuesday, Wednesday, and Friday to be appreciably greater than those on Saturday, Sunday, and Monday. In fact, there is a tendency for shipments on one or more of the days between Saturday and Thursday to become so large that at least one dip follows, before or on Thursday. Thus, the normal pattern of increase after Saturday

Figure 9. Daily Out-of-District Shipments of Fluid Market Milk by Four Cooperatives in Three Months of 1957.


NUMBER OF 21,500-POUND TANKERS
JANUARY
JUNE
JULY
S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Source: Approximated from records of the four associations.

and decrease after Thursday is not found in Figure 9 in ten of the twelve full weeks shown (and absent more often than present in the case of the individual associations). In each of these ten weeks, there was at least one abnormal movement between adjacent days. The normal pattern is therefore modal, not usual.[26]

The amplitude of the cycle is very large for all four of the associations. We have seen that Thursday is not always the peak day. But even if we consistently compare shipments on Thursday to the week's average daily shipments, the variation is great. For the twelve full weeks shown in Figure 9, the ratio of Thursday shipments to the week's average daily shipments ranged from 121 percent to 163 percent, with a mean ratio of 144 percent.[27] Except for the seasonal swing in the "surplus" (see Figures 10 and 11) this is the largest relative amplitude in the series shown in this study. It stands in contrast to a comparatively uniform receipt of milk over a week's time.

The existence of this weekly cycle in shipments of market milk tends to inflate the cost of milk marketing.

The cycle implies that a corresponding cycle exists either in storage or in diversion to manufacturing. In some associations and seasons, receipts of Grade A milk will exceed Class 1 sales even on Thursdays. Then the amount of Grade A milk diverted to manufacturing will rise and fall as Class 1 sales respectively fall and rise. To accommodate the Saturday diversion requires extra facilities for either holding or immediate

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26/ There are seven pairs of adjacent days in the week. For each taken separately, the likelihood is less than 50 percent than an abnormal movement will occur--say a decrease from Monday to Tuesday. But for no pair is the likelihood negligible. The likelihoods are sufficiently large that the changes are appreciably greater than 50 percent that some abnormal movement--at least one--will occur in a given week.

27/ Looked at differently, the ratio of Saturday to Thursday shipments (neither day being always a turning point) ranged from 20 percent to 50 percent, with a mean of 32 percent.

processing. In other associations and seasons, daily Class 1 sales in midweek exceed daily Grade A receipts. Milk received on other days is carried over to meet the peak demands, the oldest receipts being sold first to maintain freshness--"pyramiding." Then holding facilities are needed in order to carry milk supplies until the last day on which sales exceed receipts.

In addition, the rise and fall in shipments implies a poor load factor for the manpower and facilities involved. Worthwhile offpeak chores evidently can be found for some of the manpower at the cooperatives' plants, although a variety of complications are created. But the road tankers that haul the milk to metropolitan distributors are apparently too specialized for other uses.28/

Tankers have been acquired to meet peak demands for transportation--those that prevail, say, on a Thursday in September. A substantial proportion of this equipment stands idle in the yards for part of the week during even the busiest season. This is costly when a tractor and single tanker represent an investment of some $50,000 and when drivers' wages tend to reflect standards for a full week's pay.

In the case of the cooperatives, as with many of the proprietary plants in the San Joaquin Valley, transportation services are purchased from State-regulated trucking companies that own the equipment. These companies face continually rising labor costs. A better load factor would contribute materially at least to staying the increases that will be permitted in the

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28/ This situation may change. A collapsible bag of rubber-coated rayon has been developed with which dry cargo carriers can readily carry fluids. A polyethylene liner is used to protect edible liquids. This development could reduce the need for charges to dairymen to cover both empty return trips and offpeak idleness. See California Farmer, October 11, 1958, Vol. 209, p. 364.

price of milk transportation. It might even be arranged that the trucking companies make tariff concessions on contracts that assure them a better load factor.

It is not feasible for the cooperatives to alter the weekly cycle in retail demand that generates the cycle in shipments.[29] Even faced with the weekly cycle in retail sales, however, there remain certain possibilities of better adapting to it in order to reduce costs. To the authors it would seem worthwhile for the cooperatives to arrange for a detailed cost study of the suggestion that follows.

The suggestion is to locate facilities for pyramiding the market milk of one or more of the cooperatives (and perhaps others) at or near the metropolitan processing plants to which deliveries are regularly made. These facilities would be in addition to storage facilities in the Valley. Locating one or more of the installations right at distributors' plants would tend to minimize the costs involved. It would lessen the cost of creating new facilities and would reduce intracity hauls from holding tanks to distributors' plants. The facilities might be owned, leased, or hired either by the cooperatives, acting singly or jointly, or by the distributors, and operated by either. At this stage, however, these are not central issues.

The central point is that metropolitan location of pyramiding would permit more uniform shipments to metropolitan areas throughout the week. Ideally, the amount shipped each day would equal the average daily sales for the week. On days when sales were below average shipment, averages would

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29/ It is questionable whether even a substantial excess of the weekend retail price of milk over the midweek price would materially alter the pattern in retail milk sales. It is also questionable whether such a price differential would be introduced in the system of State-enforced minimum retail prices and, if so, would in fact appear in retail prices.

be enough to cover sales in excess of shipments during the remainder of the week.

The advantages are most evident for the fall months, when Class 1 sales and proportionate Class 1 use are greatest. This is the season in which the peak day's Class 1 sales are most likely to exceed the day's Grade A receipts, so that pyramiding will occur to cover the peak sales. It is also the season in which shipments and the demand for trucking are greatest. If pyramiding facilities were in the metropolitan area, shipments and trucking capacity could more nearly adapt to average daily sales rather than to peak day's sales.

The advantages of relocation would be less during other seasons. The likelihood is much greater that Grade A receipts will exceed Class 1 sales even on Thursday in those seasons. There is then no necessity of pyramiding, though it would still help stabilize the amount of "surplus" manufactured each day. There would also be smaller savings as daily shipments are evened out, since trucking capacity, adapted to fall demands, is then less scarce.

Nevertheless, trucking capacity might often be taxed to meet peak days' shipments even in the spring if capacity were able, with relocation of storage, to adapt merely to average daily demands in the fall. We saw earlier that the five-year mean ratio of the cooperatives' April-to-October average daily Class 1 sales was 74 percent. Roughly speaking, this means that uniform daily shipments in the fall would average about one and one-third times uniform shipments in the spring. Thursday shipments, however, we saw in discussing Figure 10, average almost one and one-half times the week's average daily shipments.

The implication is that a trucking capacity adequate, on a uniform daily basis, for a week in October would often be inadequate, on the current basis, for a Thursday even in April. In this case, pyramiding at the processing area would to some extent economize on trucking capacity (as well as on drivers) even outside the fall season.

Beyond the smaller advantages in other seasons, there are some obstacles to obtaining any advantages to offset the costs involved.

Because the flavor of milk tends to deteriorate even under proper refrigeration, holding raw milk for fluid consumption longer than two days from pickup to pasteurization is not safe. This assumes that milk is picked up from a dairy every second day, and so may already be over a day old at the time the cooperative takes possession. The risk of deterioration implies that shipments cannot always be made uniform through the week. Shipments cannot be uniform unless sales are sufficiently uniform that Saturdays' shipments would be sold before Tuesday. Thus, fully uniform shipments would not be feasible for the association, which commonly sells no market milk from Saturday through Tuesday. It could make uniform shipments only from Monday through Friday of each week. But even this might offer substantial economies compared to the present pattern of shipping on only three days and in highly unequal amounts.

Another obstacle is that there is, for at least two of the associations, considerable variability in the weekly sales pattern. They cannot easily predict either the day or the amount of peak sales. They may not even know until midmorning whether sales for a day will be large or small.

Furthermore, unusually small or large sales on a given day are not necessarily offset during the remainder of the week. Average daily sales

may change markedly from one week to the next. Thus, we can calculate the change in average daily sales between consecutive weeks for the data shown in Figure 9. The minimum change amounts to only .5 percent. But the maximum was 36 percent and the mean 14 percent. Sales change with the weather, the holding of conventions, and other uncontrollable factors.

The risk of deterioration aggravates the problem of unpredictability in sales. Shipments that prove excessive cannot simply be held at metropolitan holding facilities until sold. There is some desirable flexibility in receiving and holding potentially "surplus" Grade A milk at a location where dairy products are manufactured (or manufactured economically). Indeed, occasional return trips in otherwise-empty tankers would not seem to be calamitous; they sometimes occur even under existing arrangements. Furthermore, there may be means of lessening the unpredictability of sales. It would seem to be worthwhile--whether or not relocation of storage is contemplated--for the creameries, and for the Bureau of Milk Control of the Division of Marketing, California Department of Agriculture, to search for means and inducements to obtain greater advance notice from distributors of their intentions, or to encourage them to buy in advance and pyramid themselves--perhaps by raising minimum producer prices on peak days (or lowering them for trough days).

However, to the extent that distributors' demand remains at least somewhat unpredictable and manufacturing remains in the Valley, shipments will in fact be uneven, and Grade A holding facilities at or near metropolitan plants will only supplement, not supplant, those in the Valley. With respect to holding facilities in the Valley, it should be mentioned that it might also pay the cooperatives to consolidate these, maintaining fewer and larger tanks at strategic locations.

E. Direct Shipment

The location of holding facilities at or near metropolitan processing plants is related to another potential means of economizing--direct shipment of Grade A milk from dairy farms in the San Joaquin Valley to metropolitan holding or processing plants, bypassing the country plants. We suggest that the cooperatives arrange a detailed cost study of costs and benefits associated with direct shipment of Grade A production whose sale as market milk is reasonably predictable.

A variety of evidence indicates that bulk tank facilities have been installed by the overwhelming majority of producers who ship Grade A milk to country plants south of Fresno.30/ North of Fresno, where market milk producers are generally smaller, a number of mixed and entirely can-receiving plants can still be found at this writing (though producer smallness is an effect as well as a cause of using cans). Bulk-tank pickup, however, is now the general situation among producers who ship market milk to the cooperatives.

Bulk-tank pickup implies two things that are relevant here: 1) that tank trucks are already collecting the dairies' production; and 2) that refrigeration facilities at the ranches are adequate to secure a temperature of, say, 38 degrees Fahrenheit. This is perhaps the typical temperature to which milk is now being cooled at country plants before it is hauled to city plants.

Given bulk-tank pickup and adequacy of cooling equipment, two other obstacles to direct shipment seem comparatively minor:

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30/ See, for example, the Appendix in the Bureau of Milk Control's "Preliminary Progress Report on Country Plant Handling Charge Study," an undated report mimeographed in 1957.

## 7. Other Business

Mr. Jackson, of Bowling Green, at 11 o'clock p.m., moved that the meeting adjourn. Motion carried.

Mr. Jackson moved that the Secretary cast a unanimous ballot for the re-election of Dr. Ralph Ellsworth, Dr. Kenneth Bloom, Dr. Dorothy Bloom, and Dr. Jack Bloom as directors for the ensuing year. Motion carried.

Dr. Ellsworth, of Bowling Green, moved that the Secretary cast a unanimous ballot for the re-election of Dr. Ralph Ellsworth, Dr. Kenneth Bloom, Dr. Dorothy Bloom, and Dr. Jack Bloom as directors for the ensuing year. Motion carried.

Dr. Ellsworth, of Bowling Green, moved that the meeting adjourn. Motion carried.

1) Access roads and turnaround space at some ranches may not be adequate for tanker trains, especially in winter. The tanker train (pair of tankers pulled by a single tractor) is now in common use for the haul to city plants. It is undoubtedly important to preserve the economies effected by trains over single tankers. To do so and yet employ direct shipment might require efforts at some locations to improve access ways, or else imply providing for delayed or repeated coupling of the tankers.

2) The tankers now used for collecting milk from producers' locations carry a pump and sanitary transfer hose. These are used to extract milk from the producers' holding tanks. The tankers used for city runs do not carry this equipment, thereby saving weight. The extra weight, however, would not seem oppressive--evidently 1,200 to 2,000 pounds. This is less than 5 percent of the usual capacity of a train, since a train of two 2,500-gallon tankers carries 43,000 pounds of milk at 8.6 pounds per gallon.

Moreover, there are possibilities of not carrying the pumping equipment on to the city. It would not be impossible to make the transferring equipment (or gravity flow) part of the facilities expected to be present at the dairy (we are not recommending this, but only mentioning it as one possibility). Another possibility would appear more economical. Detachable pumping units might be carried on the pickup part of a tanker's run and left at a road station before making the city run. Detachable units appear quite feasible to people in the industry, and at least one trucking company has been studying the subject.

Against the costs of surmounting these (and perhaps other) obstacles are to be set the advantages of direct shipment. One advantage is quite obvious, but not less significant because it is obvious. Direct shipment

would mean no delay and no handling at the country plant before milk moves on to its destination.

Another gain could come from avoiding northward hauls to the country plant followed by southward city runs, together with avoiding the shipment of milk produced farther from Los Angeles while closer milk is not shipped; shipments could go from the ranches nearest the market, without a backhaul to the country plant. The gains would be greatest, of course, if the several cooperatives were able--by contract or merger--to assure that milk went to market from the closest ranch affiliated with any of them (or from the closest holding tank when shipment is made from a country plant). Milk produced near Tulare would be shipped to Los Angeles before milk from the Fresno area.

Direct shipment can also mean that fewer tank trucks would be needed to move a given amount of milk from the ranches to the city plants. When different trucks are used for field pickup and city run, problems of synchronization arise.[31] It may be possible for individual creameries

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31/ The number of road tankers used should be a multiple of the number of their feeding field tankers equal to the ratio of the average time required by each to complete its delivery and maintenance per thousand gallons of milk. Thus, a field tanker that will pick up 2,500 gallons may require an average of two and a half hours between successive deliveries to the country plant. This is one hour per thousand gallons. A road train with 5,000 gallons may average fourteen hours between successive departures for Los Angeles from the country plant. This is 2.8 hours per thousand gallons. The ratio is 2.8 divided by one, or 2.8. Hence, the number of road trains owned (or train hours hired) should be 2.8 times the number of field tankers owned (or tanker hours hired). Then their capacities will be matched.

There are obstacles to achieving the multiple. It may not be possible to own 2.8 road trains for each field tanker owned. Yet to own only two trains per field tanker would imply part-time idleness for the latter. Moreover, the organization may receive from shippers or be able to sell to distributors two train loads, not every 14 hours, but only every 24 hours. Then the train units too would be under-utilized. They could easily serve for both field pickup and city run.

to overcome these synchronization problems partly by part-time leasing of owned equipment or by part-time hiring of tankers owned by transportation companies. The indivisibilities involved imply less idleness as greater amounts of milk are involved. Nevertheless, in some instances at least, we may expect that using a given tanker unit both for pickup from ranches and for delivery to the city plant will better utilize trucking capacity.

Improving tanker utilization, eliminating backhauls and longhauls, and avoiding needless handling are advantages that, at least sometimes, may make direct shipment more economical. But it should be clear that these advantages relate primarily to the pickup of Grade A milk expected to be shipped to a city plant. That is, they relate to the pickup of milk that would go into more uniform shipments to holding and processing facilities located in the metropolitan areas. The advantages obviously would not exist for milk that would be separated at the country plant and only the cream shipped on. Neither would they exist where the likelihood is small that the mill will, today or tomorrow, find a Class 1 buyer; then too much raw milk would be making a return trip to the Valley for manufacturing at the country plant. Thus, direct shipment, like relocated holding, is by no means being suggested for study for all Grade A production--and the problems of deciding specifically which production may raise further problems.

If done for part, however, each suggestion might effect material economies. This is especially so if the suggestions are implemented together. Then more of Monday's pickup would be going to the metropolitan area on Monday, and more could go directly from the dairies.

Depending on investments and hauling charges, the transition to greater use of direct shipment, if it proves economical, might well be gradual. It might occur in proportion to the sale or retirement of the older field tankers now being used for picking up Grade A and Grade B milk. Given existing road weight limits, these older tankers are often too capacious and (when full) too heavy to be used in train for the city runs.[32] It would probably not pay to use them for direct shipment.

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32/ Bureau of Milk Control, "Preliminary Progress Report on Country Plant Handling Charge Study," op. cit., p. 3.

F. The Country-Plant Handling Charge

The country-plant handling charge is of special concern to Grade A producers in the San Joaquin Valley who deliver to proprietary country plants. It affects the price these producers receive when their milk does find Class 1 use. If milk is handled at a country plant, the legal minimum producer prices for Class 1 sales (f.o.b. the country plant) are reduced by the country-plant handling charge, set by the Bureau of Milk Control. This charge is additional to the charge made for the pickup of milk from dairy farms. The handling charge is supposed to compensate distributors for receiving, weighing, testing, cooling, holding, handling, and reloading milk shipped to a city plant for Class 1 use.

The maximum permissible handling charge was set before World War II at eight cents per hundredweight of milk. After the war, this was increased to 18.5 cents, to 24 cents, and finally, in 1955, to 27 cents. In 1958, however, it was sharply reduced. The handling charge was cut from 27 cents to 15 cents per hundredweight of milk, and from six cents to 3.5 cents per pound of fat for milk separated at the country plant for shipment as bulk fluid cream. The sharp reduction followed cost studies by the Bureau of Milk Control indicating that handling costs at country plants having bulk tank pickup were appreciably below the maximum charges then permitted.[33/]

The amount of the handling charge does not directly affect the member-patrons of the five cooperatives involved. The cooperatives make a somewhat analogous deduction from producers' payments, in the form of

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33/ See Exhibit 4, Public Hearing of the Bureau of Milk Control, Fresno, California, June 24, 1958.

## F. [illegible] Meeting Dates

the operating retain. Any difference between the aggregate operating retain and the estimated actual costs incurred by the cooperatives, however, tends to be included in members' patronage refunds. But the handling charge made by proprietary country plants on their patrons' milk does affect the cooperatives indirectly. It affects their competitive position in attracting producers. The greater is the handling charge at proprietary plants, the more attractive to producers will be the cooperatives' payments--unless an "excessive" handling charge makes Class 1 sales from country plants more attractive to proprietary distributors and thereby reduces those plants' "surplus."[34] For this reason, and also because of the importance of the handling charge to producers in the Valley in general, the handling charge is one of the topics included in this report.

We raise no questions about the precise amount of the maximum permissible handling charge. We do not attempt to review the unit cost data compiled by the Bureau of Milk Control, or the average markup that it chose to allow, although questions could always be raised.[35] There is no "right answer," and the best that any agency can do in fixing a permissible charge when one is appropriate is to come within a range that most informed people would agree is plausible. We do not question whether the recent 15-cent figure falls within this range, because it appears to us questionable whether any deduction is now appropriate on at least some Class 1 milk sales.

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34/ Moreover, the higher is the handling charge, the stronger is the inducement for distributors to establish or maintain country plants in the Valley in competition with the cooperatives, and the more they may be able and willing to pay producers for Class 2 or Class 3 usage.

35/ Interested parties could always question, among other things, the methods of allocating common costs, the valuation of byproducts, the charges allowed for the use of long-lived and unpurchased inputs, the prices set on short-lived inputs, the plants whose costs were to be covered, the rate of profit implied by a given markup, and the rate of profit that ought to be made.

When most of the milk supplied by producers in the San Joaquin Valley was collected in 10-gallon cans, it was clearly more economical to have the milk assembled at country plants for cooling and shipment in tank trucks. There was an additional advantage in that "surpluses" could be more economically diverted into manufacturing at the country plants after being held until it was apparent whether they would find a Class 1 use. Of course, there definitely are costs in handling milk when it is received at a country plant for transshipment to a city plant, even when the milk is received in tank trucks (and even though it is difficult to estimate the costs). And under certain conditions all, or part, of these costs could be properly regarded as part of a Valley producer's location differential. This would be the case if the total cost of shipping market milk from the ranches to the city plant were lower through a country plant than through direct shipment. As we saw earlier, however, this may no longer be true with respect to predictable sales of market milk.

If not, it follows that no differential in producer prices corresponding to the handling charge on milk sales would continue under free competition.

It would also follow that the present handling charge may be creating incentives that work against efficient marketing. Distributors may be encouraged to make needless and costly tanker stops at the country plants merely to collect the charge.[36/] They may be artificially encouraged to maintain or establish country plants that might not be justified except by profits from country-plant handling. They may be encouraged to receive and pyramid milk in the Valley, rather than--as we suggested earlier--at

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36/ That needless stops are in fact occurring is commonly asserted. For present purposes it suffices to say that there would be an incentive to make them.

metropolitan holding tanks to which both direct and more uniform shipments could be made. Distributors with country plants may incur lower raw milk costs that are unrelated to their individual efficiency. In turn, producers may be artificially encouraged to try to make sales where 15 cents is not deducted--that is, to incur costs that might otherwise be unnecessary.

Hence, if direct shipment is in fact more economical with the advent of bulk-tank pickup, the country-plant handling charge on at least predictable sales of market milk may have become a disadvantage to Valley producers that is not justified by--but rather contrary to--considerations of economic efficiency.

This is not to say that, with the advent of bulk-tank pickup, the country plants would perform no service with respect to any Class 1 sale. In discussing direct shipment earlier, we found reason to believe that direct shipment would not be economical when the Class 1 usage is a sale of market cream (or an unpredictable sale of market milk). In this case, country plants enhance the efficiency of marketing for Class 1 use. They economize on transportation by diverting "surplus" Grade A skim milk (and whole milk) at points near the producer, which may also be locations at which manufacturing operations have lower costs.

By so doing, the country plants perform a service useful both to consumers and to the group of Grade A producers whose milk is separated. Without the country plants, the unit costs of marketing would be greater. Under pure competition, and presumably under state regulation, these higher costs would tend to enhance marketing margins. In turn, this would imply either higher prices at wholesale and probably retail, or lower prices paid to producers in the areas now served by the country plants, or both.

With the country plants, competition, and presumably state regulation, would still force consumers to pay enough for market cream to cover the costs of separating and shipping, but they would not need to pay so much, because marketing costs would be reduced. In turn, prices to Valley producers would be improved, or at least not worsened, relative to those they would receive without the country plants. Their returns would also be improved relative to those of producers nearer Los Angeles, since the locational disadvantage of the Valley is reduced by the smaller cost of hauling their milk fat in the form of cream.

This is not to say, however, that with pure competition the producer price per pound of fat at a country plant in the Valley would equal the producer price (f.o.b. Los Angeles) less the cost of shipping cream from the country plant to the city plant. This could make the producer price higher in the Valley than at some direct-shipping ranches closer to Los Angeles that pay the transportation cost of shipping whole market milk. Rather, the price that a producer would tend to receive for a pound of fat (f.o.b. the country plant) under pure competition would equal this: 1) the producer price per pound of fat (f.o.b. the ranch economically farthest from Los Angeles of those that usually ship fluid milk direct during that season) less 2) the hypothetical extra cost of shipping a pound of fat in the form of cream to Los Angeles from the country plant instead of from that farthest ranch shipping direct.

Under pure competition, therefore, Grade A producers whose milk is separated at a country plant would not receive the producer price (f.o.b. Los Angeles) less the cost of hauling cream to Los Angeles, but rather that amount less a further deduction. The deduction, however, would

correspond to the extra transfer costs incurred in shipping milk fat from a point as far as the country plant. It would not be for, or necessarily cover, the costs of handling and separating at the country plant; resale prices would presumably cover this. To orient the deduction toward separation costs could generate incentives toward inefficient marketing practices, such as excessive separation.

We have indicated that there may be grounds for considering it uneconomical and--in the sense defined earlier--unfair for a country-plant handling charge on milk sales to create an additional difference between payments to Valley producers and payments to direct shippers, and for a handling charge on cream sales to create a deduction different from the extra costs of transfer.[37] We suggest that the Bureau of Milk Control consider whether the possible economies in different shipment remove the justification of a country-plant handling charge on at least some Class 1 milk sales, and whether the handling charge in Class 1 cream sales corresponds merely to extra shipping costs.

It should be pointed out that, even if correct, our suppositions do not necessarily imply that minimum producer prices on certain Class 1 milk sales (f.o.b. the country plant) should in fairness be increased 15 cents over current levels. What we have said pertains to the difference between prices at the country plant and prices to direct shippers. This could be narrowed by decreasing the latter, by increasing the former, or--as might tend to occur if price controls were removed--by decreasing both, but the latter more than the former. Of course, if price controls are to be continued and if the prevailing minimum price to direct shippers is accepted as a standard, it might be appropriate to reconsider for what Class 1 milk sales a deduction for country-plant handling is justified.

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37/ With respect to "fairness," we noted in connection with the burden of "surpluses" that the prices existing producers paid for their farms somewhat muddy the conclusion. Here we should note that an "excessive" handling charge may improve Class 1 demand to Valley producers and make them better off than without the charge. This result is possible, but the evidence to test it is lacking, and offhand we doubt its correctness since, among things, it implies that demand averages elastic. Furthermore, there remains the question of encouraging inefficient practices.

## G. Availability of Milk for Manufacturing

The San Joaquin Valley has long been the State's leading district in the production of Grade B milk. It now accounts for about two-thirds of California's total production of Grade B milk fat (see Figure 2). Since World War II, however, Grade B production in the San Joaquin Valley has fallen rapidly except during 1953-1955.[38] (See Figure 10.)

Parallel movements have occurred in all other districts (except Southern California, whose contribution is quite small). The downtrend may be attributable to a combination of factors--reduced Grade B prices (see Table 5), the increased Class 1 differential (see Table 5), rising costs, competing profit opportunities, and the investment implied in bulk-tank pickup.

Receipts of Grade B milk by the five cooperatives have moved similarly to production in the State and in the San Joaquin Valley as a whole (see Figure 11). The cooperatives' shares of the State's and the Valley's declining Grade B production have remained rather steady, respectively at about 18 percent and 27 percent (see Table 2). Grade B receipts by the individual cooperatives reached their recent peak in 1954, 1955, or 1956, and thereafter declined, at rates ranging from extreme to moderate.[39]

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38/ By 1956 Grade B milk fat production in the San Joaquin Valley had fallen below Grade A production (the transition year was 1955 in terms of whole milk). Taking both together, however, the San Joaquin Valley has been and clearly remains the State's leading district in total milk production, accounting for about 40 percent of the State's output of milk fat.

39/ A slight lag relative to the average for the San Joaquin Valley does appear in another way. For the Valley as a whole, the last time average daily Grade B whole milk production exceeded Grade A production was 1954 on an annual basis, and August, 1955, on a monthly basis (in the case of fat production, 1955 and September, 1955). (Crop and Livestock Reporting Service, Dairy Information Bulletin, Vols. X-XIV, Tables 3, 7, 13.) Figure 3 shows when this milestone was reached by the cooperatives as a group. It was 1957 on an annual basis and September, 1956, on a monthly basis. Individually, moreover, two of the five associations had not passed the milestone as late as 1957.

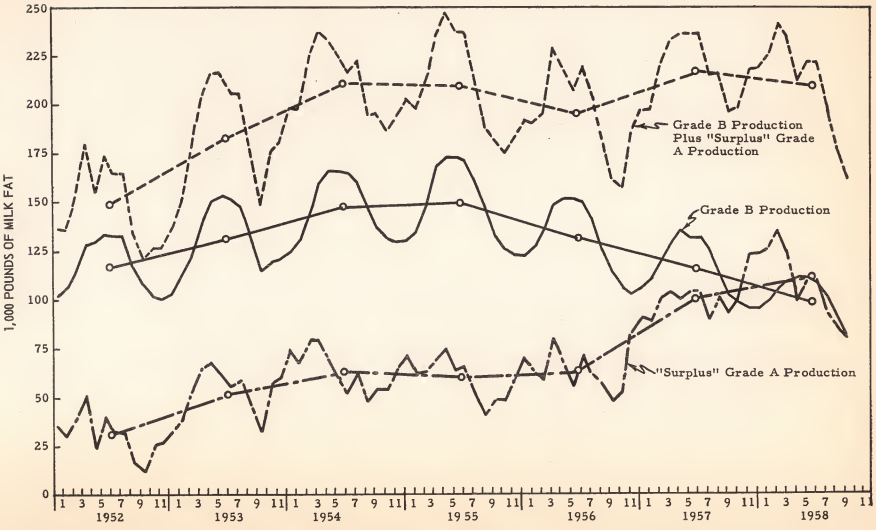
(Footnote continued on next page.)

(Footnote 39/ continued.)

This implies that the ratio of Grade A to total milk receipts varies considerably among the associations. In early 1957 the ratio for the group as a whole had reached almost 60 percent. Individually, however, the ratio varied from a low of 15 percent to a high of 85 percent. The several associations are not at all simply reiterations at different locations. They emphasize different activities, and the largest receives almost five times as much milk as the smallest.

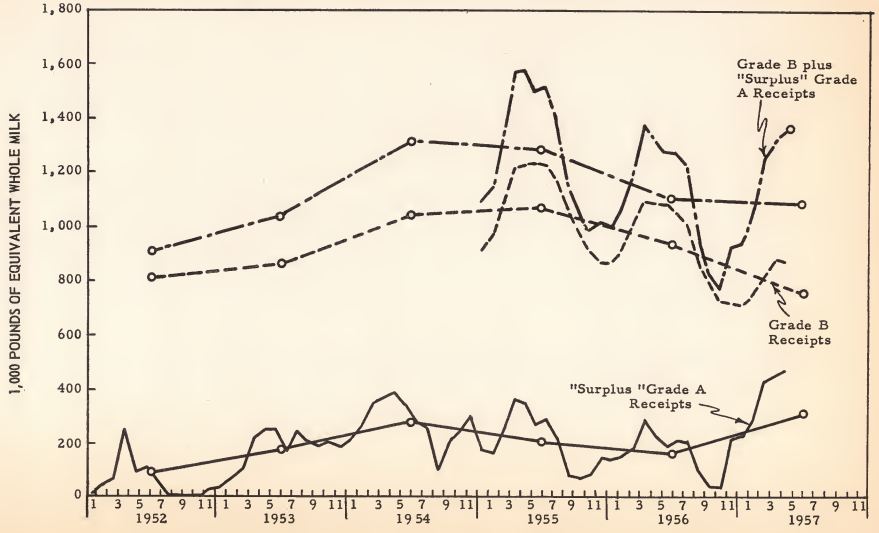
The fact remains that in all five associations Grade B receipts have been falling.

Figure 10. Average Daily Availability of Milk Fat for Manufacturing, San Joaquin Valley, 1952-1958.




Source: 1) California Crop and Livestock Reporting Service, Dairy Information Bulletin, Vols. XI–XV, Table 13.
2) 1958 annual figures estimated by the authors.

Figure 11. Average Daily Availability of Milk Fat for Manufacturing, Five Cooperatives, 1952-1957.




Source: Records of the associations, extrapolated to obtain annual means for 1957.

Grade B receipts by the cooperatives declined despite the fact that the volume of receipts per Grade B shipper has been increasing (see Table 6.)[40] The explanation lies in the disappearance of Grade B shippers--resulting from combination with other dairies, conversion to Grade A production, marketing through other outlets, and transfer to other lines of activity. As indicated in Table 3, the total number of members shipping Grade B milk to the five associations has declined rapidly in the last few years.[41] In 1955 the five associations had 2,007 Grade B shippers; in 1957, only 1,327--which was still, however, about three times the number of Grade A shippers.

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40/ All the associations have a definite, but irregular, upward trend in their individual mean receipts per shipper. The figures presented in Table 6 for four and five associations are representative of the direction of change for all of them. Only one of the five did not contribute to the increase in 1956 over 1955.

It may be noticed that the group's Grade B means in Table 6 are less than one-third of the corresponding Grade A means. On the average, that is, the associations' Grade A shippers were more than three times the size of their Grade B patrons. This disparity also prevails in each of the associations separately. In no case was the Grade A mean in 1956 less than twice the corresponding Grade B figure. In one association it was seven times as much.

This range implies that there is considerable dispersion behind the averages in Table 6. The group's Grade A mean for 1956 is 705,000 pounds per shipper per year. The means for individual associations, however, ranged between 538,000 and 1,197,000 pounds. Similarly, the group's Grade B mean for 1956 is shown as 227,000 pounds. The means for individual associations, however, ranged between 168,000 and 427,000 pounds.

41/ This is true of four of the five associations. The fifth, curiously, shows a slow but steady increase in the number of Grade B shippers since at least 1950, and lasting until 1957. It alone, therefore, also shows an increase in the total number of shippers. The standout association is also the only one whose membership has been growing. Among none of the five, however, is there a close relation between number of members and number of shippers.

In the case of another of the associations, receipts of manufacturing milk grew rapidly from 1952 to 1955. In fact, fast as Grade A receipts grew, Grade B receipts grew faster. The ratio of Grade A to total receipts actually declined, from 47 percent in 1952 to 43 percent in 1955. Then Grade B shippers started to disappear. Their number in 1956 was almost one-fourth less than in 1955. Grade B shipments fell even more quickly than they had risen. Evidently, shippers quickly gained can be lost even more quickly. Long-term commitments, as for facilities, should be adapted to long-term trends.

The seasonal movement in production of Grade B whole milk is regular and quite smooth (see Figures 10 and 11). It is similar to that in Grade A whole milk production, peaking in about June and troughing in about December. Amplitude of the Grade B seasonality, however, is much larger, great enough to outweigh the opposite seasonal movement in fat test and so to leave the stamp of seasonality in whole milk production on the series for Grade B fat production.42/

The seasonality in Grade B production is reinforced by that in Grade A "surplus." This makes quite large (and rather irregular) the total seasonal swing in the milk available for manufacturing. Total availability peaks in April or May, and troughs in October or November. This swing complicates the processing of dairy products, since capacity tends to adjust to peak volume but should be adaptable to economical production over a wide range of output levels. It may not pay to maintain a capacity adequate to peak availability--adequate either physically in the sense that receipts never exceed a full load for 24 hours per day, or economically in the sense that even peak receipts can be processed at "reasonable" costs. But if it does pay to maintain this capacity, it should be with the expectation of being substantially under-utilized during much of the year.43/

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42/ The ratio of Grade B milk fat production in the San Joaquin Valley in December to that in June for the calendar years 1952 through 1957 ranged from 71 percent to 79 percent, with a mean of 74 percent. The ratio for Grade B whole milk production during these years ranged from 60 percent to 71 percent, with a mean of only 65 percent.

Apparently the amplitude of seasonality is smaller in Grade A than in Grade B milk production because the push of higher feed costs is offset somewhat more in the case of Grade A production by the pull of better contracts and higher producer prices to be gained by freshening in the summer. Grade A producers may also be more specialized and "rational" in their larger operations.

(Footnote 43/ on following page)

43/ The ratio of October-to-April "surplus" for the five associations was 21 percent in 1955 and 16 percent in 1956. The ratio of October-to-April Grade B receipts was 83 percent in 1955 and 74 percent in 1956. The two combined to produce an October-to-April ratio for total availability of 69 percent in 1955 and 62 percent in 1956. This was an even greater amplitude in availability than occurred for the Valley as a whole. There the corresponding figures were 77 percent for 1955 and 70 percent for 1956, and from 1952 through 1957 the ratio of October-to-April availability in the Valley ranged from 67 percent to 84 percent, with a mean of 75 percent. For individual associations the swing was even greater than the averages may suggest. The October-to-April ratio for total availability varied from 31 percent to 86 percent in 1955, and from 23 percent to 82 percent in 1956. These figures indicate how difficult it is to stabilize the manufacturing of perishable supplies of milk.

Despite the recent sizable reductions in annual Grade B production, the total amount of milk fat available for manufacturing continued to increase for the Valley as a whole until mid-1958, and decreased only moderately for the cooperatives (see Figures 10 and 11). This was the result of a growth in the amount of "surplus" Grade A milk fat. It is evident from Figures 4 and 7 that manufacturing has been the principal disposition of the increase in Grade A production in the San Joaquin Valley, and Figure 10 shows that by November, 1957, the growth in "surplus" and decline in Grade B production had become so great that more Grade A than Grade B milk fat was going into dairy products manufactured in the San Joaquin Valley.

The future total availability of milk for manufacturing apparently will largely depend on how much Grade A production is "surplus." This is difficult to forecast. However, since California's population is growing rapidly, it would be hazardous to expect that increases in "surplus" will continue to offset decreases in Grade B production.

The cooperatives would be well advised to review in the light of these prospects the appropriateness of their manufacturing facilities--which have not changed radically in a generation. Investments aimed at adding new manufacturing capacity or at prolonging the life of existing capacity should be seriously questioned. This holds even if the investments appear to offer substantial economies when amortized over the usual spans.

In addition, but on more general grounds too, serious consideration should be given to the possibility of unifying and coordinating the cooperatives' separate operations. This might be done by mutually advantageous pooling, contract manufacturing, or--especially--mergers among the associations. Unification should be considered with a view to concentrating

manufacturing operations in fewer plants. It is true that this would often increase the distance and cost of transporting milk from the dairy to the plant. But, up to some point, these higher costs may be more than offset by economies from higher-volume operations at given locations. This point is true in general, and applies with especial force when existing capacity is already excessive at more than one location. It is sometimes even economical to scrap or "mothball" facilities that retain substantial physical usefulness.

To integrate the cooperatives' activities might offer at least two other kinds of economies. It might eliminate the crosshauling that occurs when patrons in the vicinity of one cooperative's plant deliver their production to another cooperative. Integration might also facilitate the location of collective Grade A pyramiding facilities in metropolitan areas (as suggested above) and, for Grade A milk whose disposition is not yet apparent, at one or more strategic points in the Valley.

We therefore recommend that the cooperatives arrange for a detailed study of the economies that might be obtained by adapting their operations to scales and locations that would be most efficient if they were one association.